TCM-36/459V

SERVICE MANUAL

Ver 1.2 2004.03

Photo: TCM-459V

US Model
Canadian Model
AEP Model
E Model
Chinese Model
TCM-459V
Tourist Model
TCM-36/459V

Model Name Using Similar Mechanism	NEW
Tape Transport Mechanism Type	MT-459V-118

SPECIFICATIONS

Recording system
2-track 1 channel monaural
Frequency range
250 - 6,300 Hz
Speaker
Approx. 3.6 cm (1⅞ in.) dia.
Power output
300 mW (at 10 % harmonic distortion)
Input
Microphone input jack (minijack) sensitivity 0.2 mV for 3 kilohms or lower impedance microphone
Output
Earphone jack (minijack) for 8 - 300 ohms earphone
Variable range of the tape speed
from +30% to –15%
Power requirements
- Two size R6 (AA) batteries (supplied to TCM-36 only): 3V DC

DC IN 3 V jack accepts:
- AC-E30M (TCM-36 only) or AC-E30HG AC power adaptor (not supplied) suitable in the country where the unit is to be used.
- Sony DCC-E230 car battery cord (not supplied) for use on 12 V car battery.

Dimensions (w/h/d) (incl. projecting parts and controls)
Approx. 116 × 91 × 38mm (4⅝ × 3⅝ × 1½ in.)
Mass (not incl. batteries)
Approx. 195 g (6.9 oz.)
Supplied accessories
R6 (size AA) batteries (2) (TCM-36 only)

Design and specifications are subject to change without notice.

Battery life (Approximate hours) (EIAJ*)

	Playback	Recording
Sony alkaline LR6 (SG)	11	11
Sony R6P (SR)	3	3

* Measured value by the standard of EIAJ (Electric Industries Association of Japan). (Using a Sony HF series cassette tape)

Note
The battery life may shorten depending on the operation of the unit.

Connect the AC power adaptor to DC IN 3V and to the wall outlet. Use the AC-E30HG AC power adaptor (not supplied). (For TCM-36: For Japan use the AC-E30M, not supplied) Do not use any other AC power adaptor.

Polarity of the plug

Note
Specifications for AC-E30HG varies for each area. Check your local voltage and the shape of plug before purchasing.

CASSETTE-CORDER

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Personal Audio Company
Published by Sony Engineering Corporation

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Flexible Circuit Board Repairing

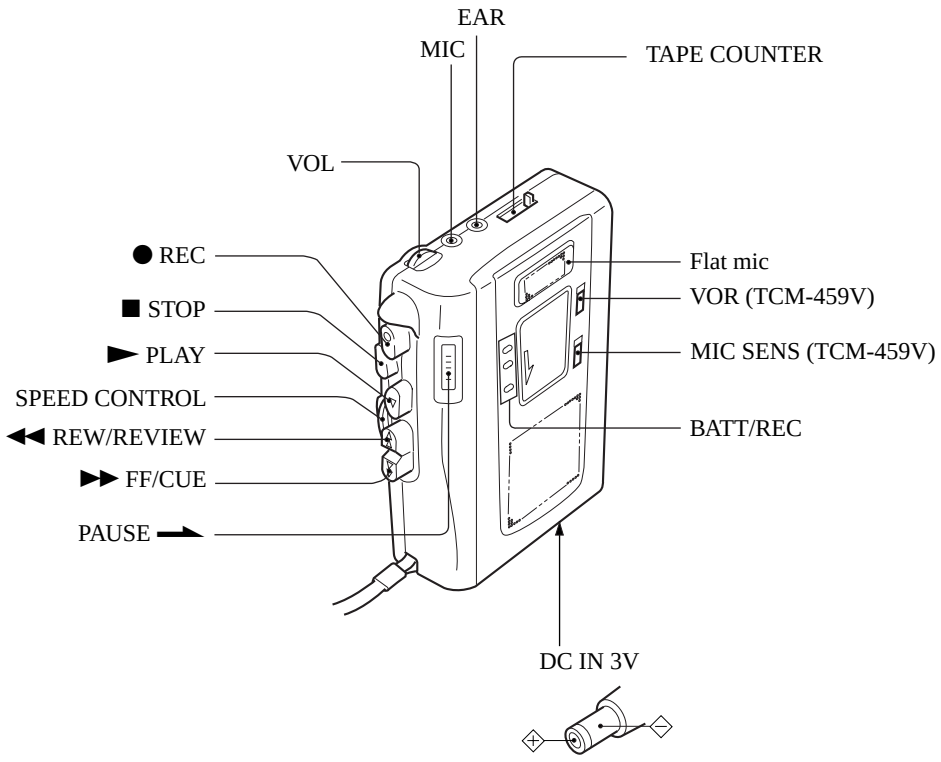
- Keep the temperature of the soldering iron around 270 ˚C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

SECTION 1
GENERAL

• Parts Identification



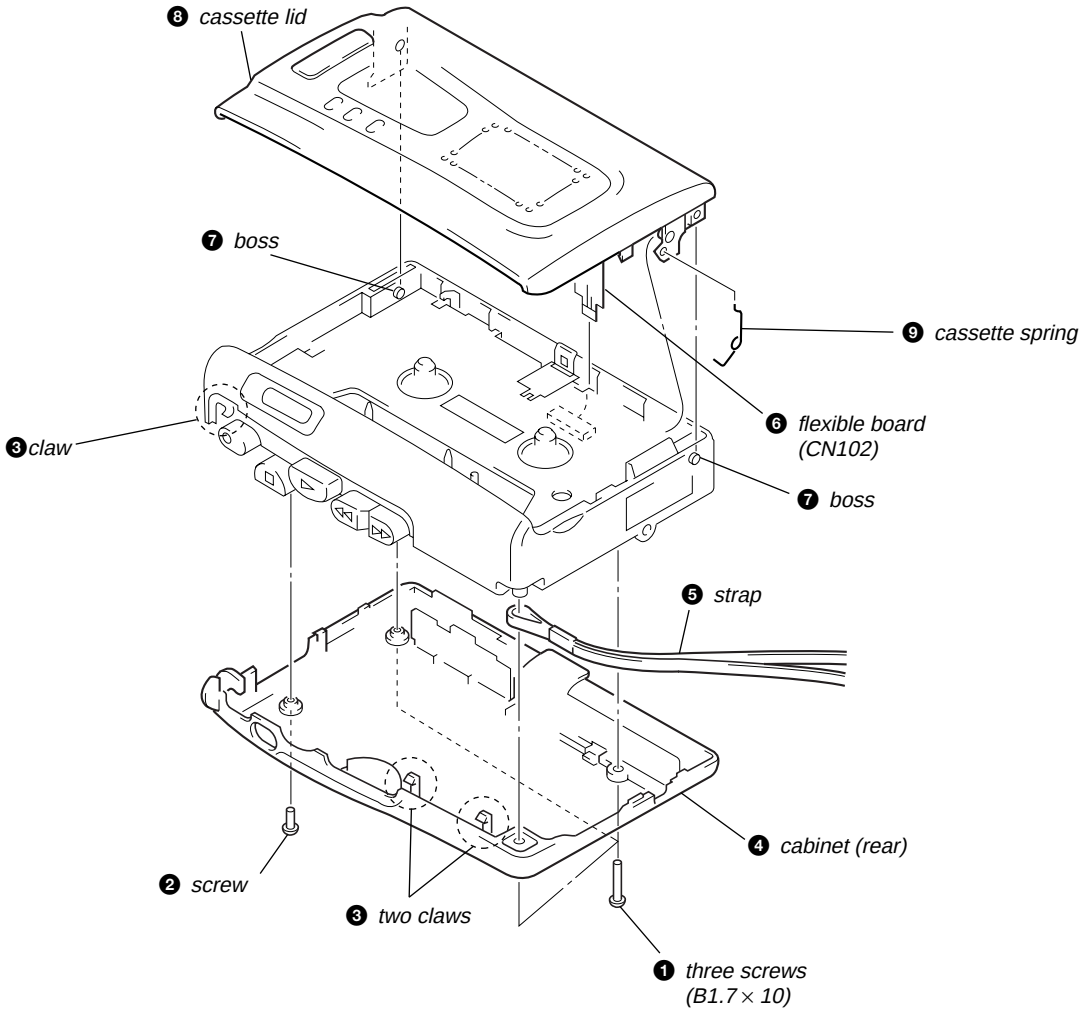
SECTION 2
DISASSEMBLY

• This set can be disassembled in the order shown below.

SET ➡ *CABINET (REAR)* ➡ *CASSETTE LID* ➡ *MAIN BOARD* ➡ *MECHANISM DECK (MT-459V-118)* ➡ *BELT*

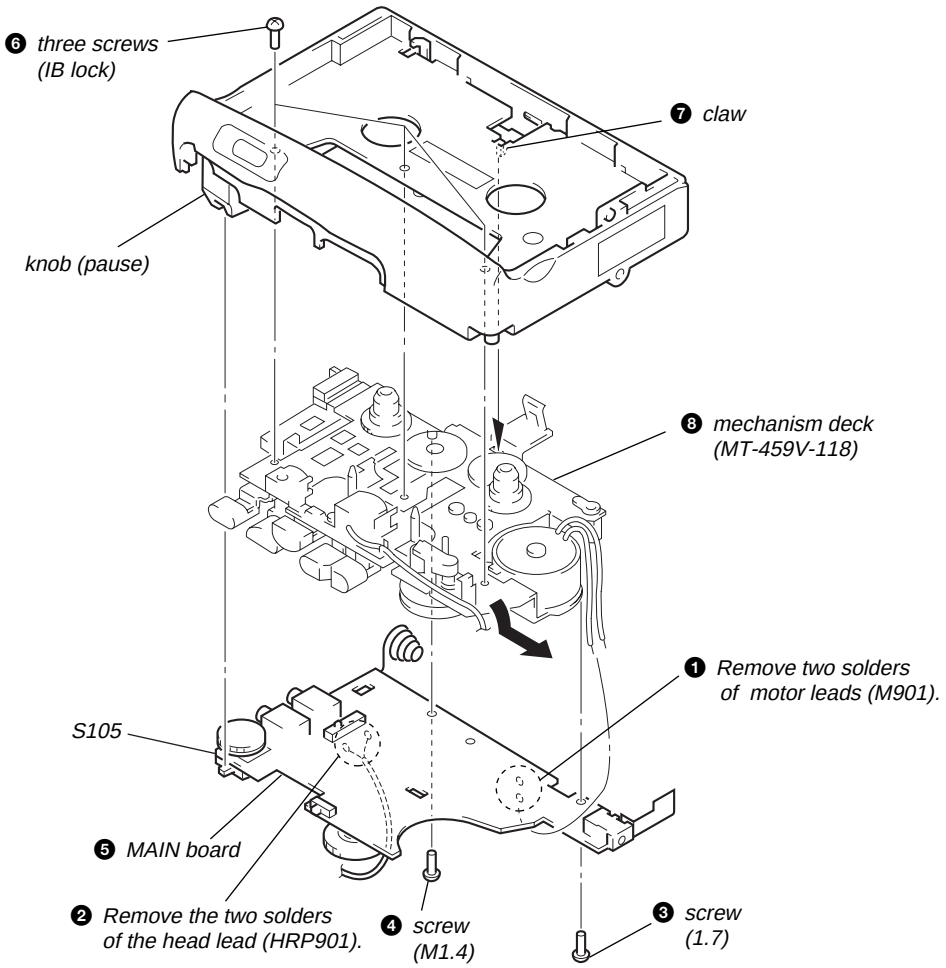
Note: Follow the disassembly procedure in the numerical order given.

CABINET (REAR), CASSETTE LID



MAIN BOARD, MECHANISM DECK (MT-459V-118)

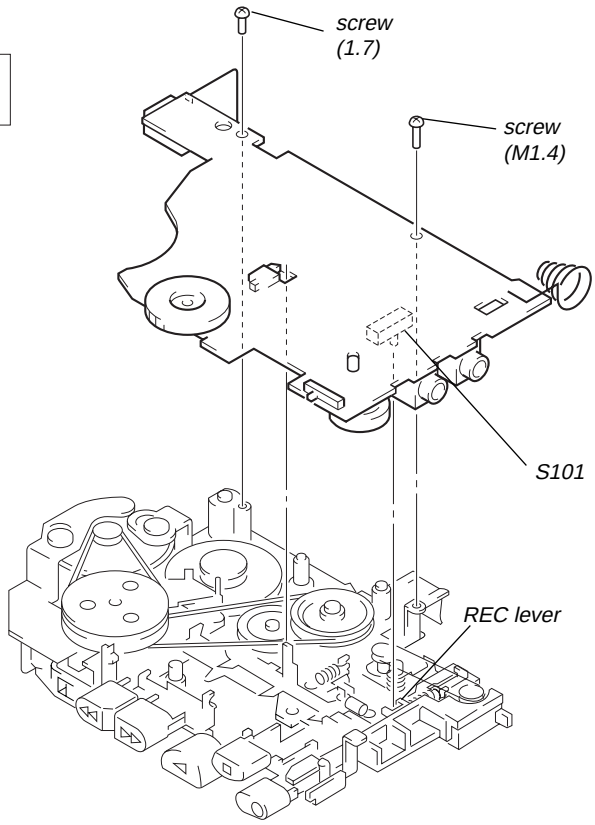
Note: On installation MAIN board adjust the S105 and knob (pause).


❻ three screws (IB lock)
❼ claw
knob (pause)
❽ mechanism deck (MT-459V-118)
❶ Remove two solders of motor leads (M901).
S105
❺ MAIN board
❷ Remove the two solders of the head lead (HRP901).
❹ screw (M1.4)
❸ screw (1.7)

NOTE FOR INSTALLATION

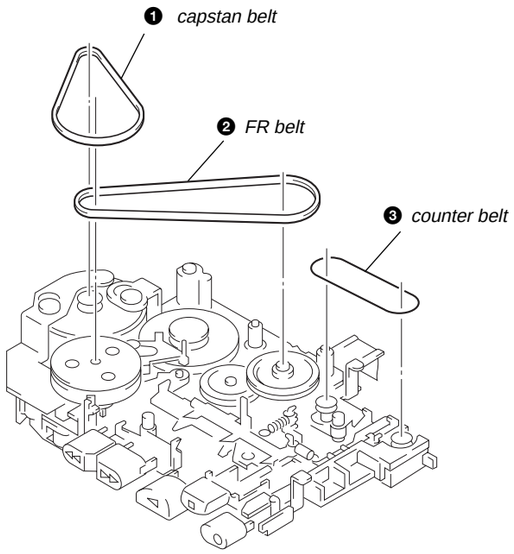
• MAIN BOARD

On installation MAIN board adjust the S101 and REC lever.



SECTION 3
MECHANICAL ADJUSTMENTS

BELT



1. Clean the following parts with a denatured-alcohol-moistened swab:
   record/playback head, erase head, capstan, pinch roller, rubber belt, idler
2. Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage (2.5 V) unless otherwise noted.

Torque Measurement

Mode	Torque Meter	Meter Reading
FWD	CQ-102C	22 – 48 g•cm (0.31 – 0.67 oz•inch)
Forward Back Tension		1.0 – 4.5 g•cm (0.014 – 0.063 oz•inch)
FF, REW	CQ-201B	more than 50 g•cm (more than 0.69 oz•inch)

Tape Tension Measurement

Mode	Tension Meter	Meter Reading
FWD	CQ-403C	more than 50 g (more than 1.76 oz)

SECTION 4
ELECTRICAL ADJUSTMENTS

Precaution
- Supplied voltage: 2.5 V
- Switch and control position
  VOR switch (S401): OFF (459V)
  PAUSE switch (S105): OFF
  VOL (RV101): mechanical mid
  SPEED CONTROL (RV602): mechanical center
  MIC SENS switch (S201): H (459V)

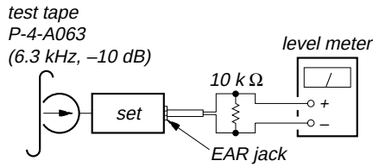
Test Tape

Type	Signal	Used for
P-4-A063	6.3 kHz, –10 dB	head azimuth adjustment
WS-48A	3 kHz, 0 dB	tape speed adjustment

0 dB=0.775 V

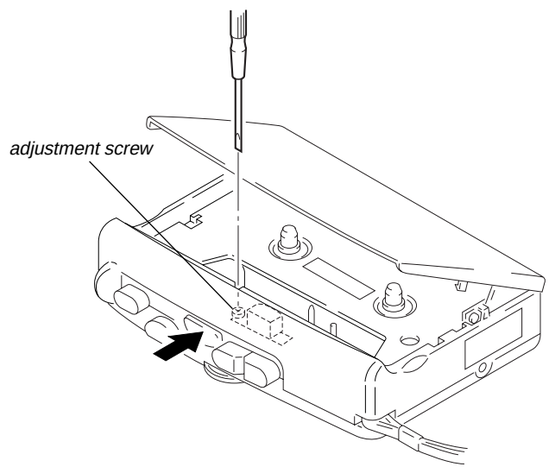
Record/Playback Head Azimuth Adjustment

Procedure:
Mode: playback



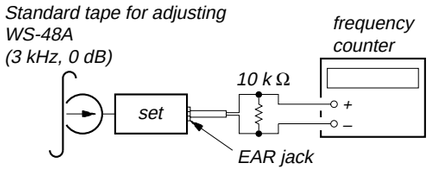
1. Turn the adjustment screw to obtain the maximum reading on level meter.
   Note: Several peaks may appear, but take the maximum.
2. After the adjustment, lock the adjustment screw with suitable locking compound.

Adjustment Location:



Tape Speed Adjustment

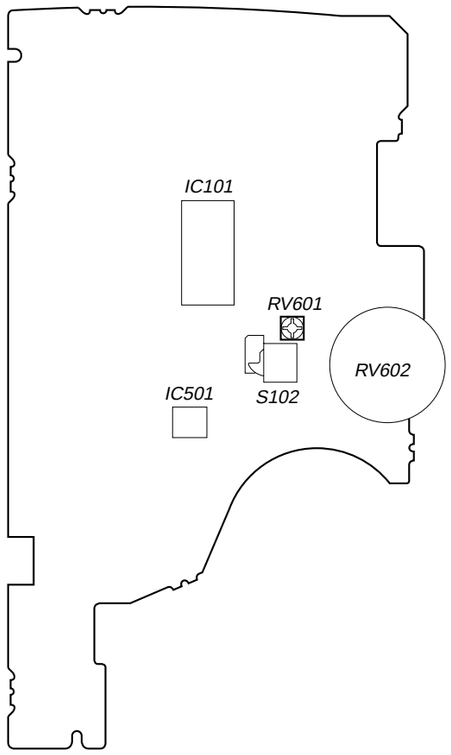
Procedure:
Mode: playback



1. Play back WS-48A (tape end part) and adjust RV601 so that the frequency counter reading becomes 3,000 ± 15 Hz.
2. Play back WS-48A tape the beginning and the end part, check that the frequency counter reading is within same standard of step1.

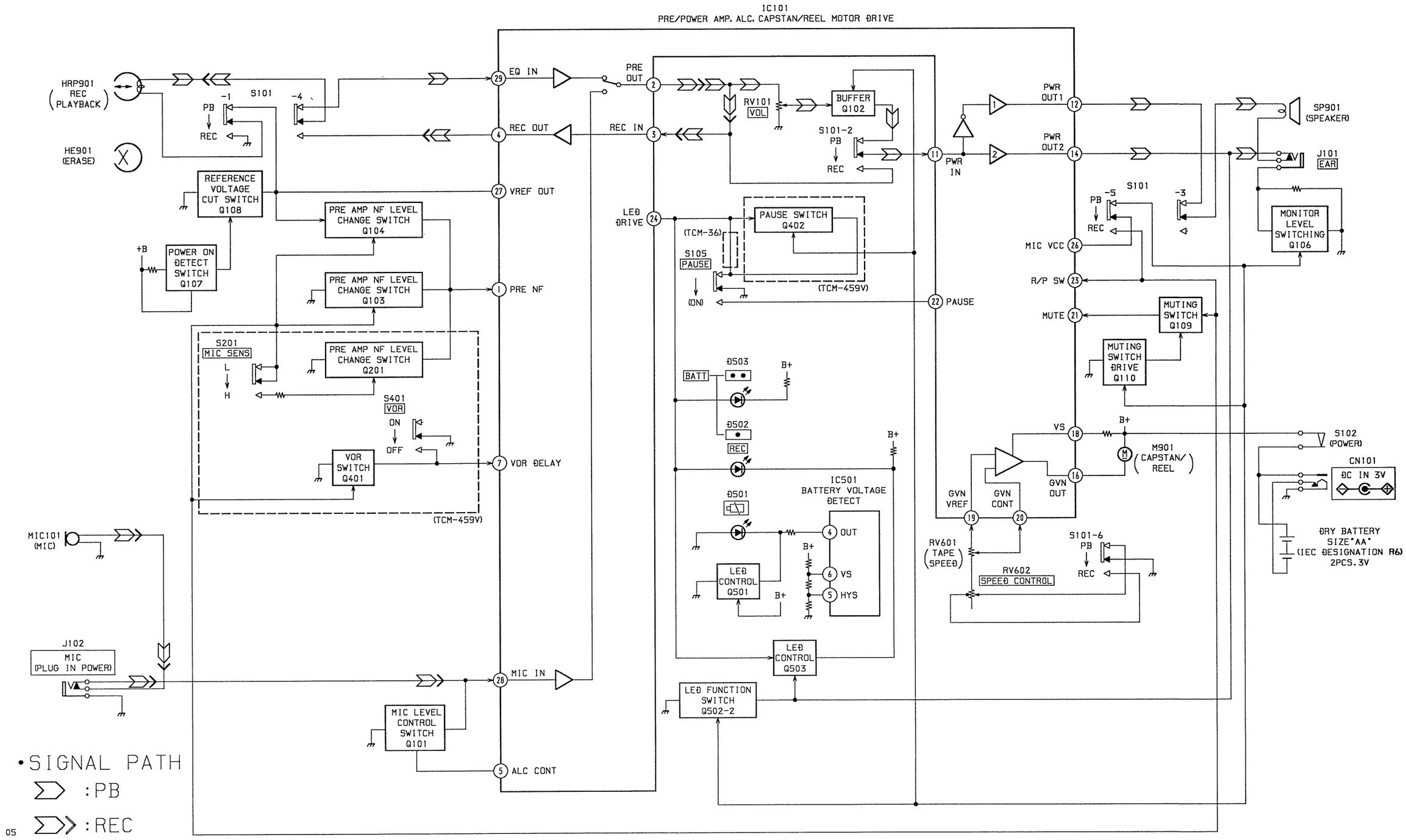
Adjustment Location:

[MAIN BOARD] (Side B)

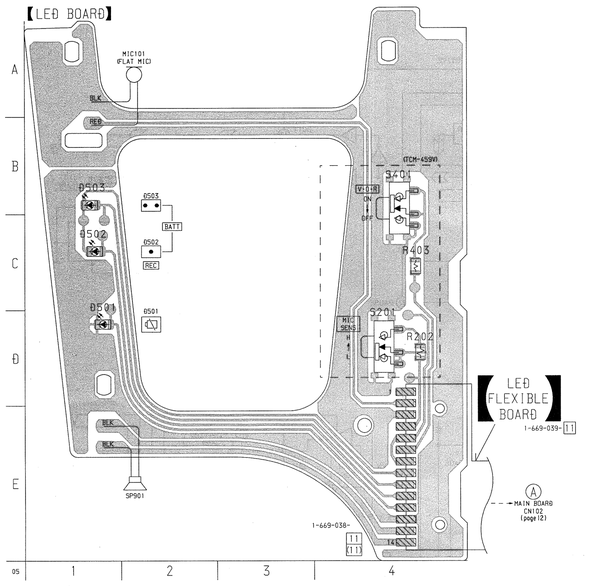


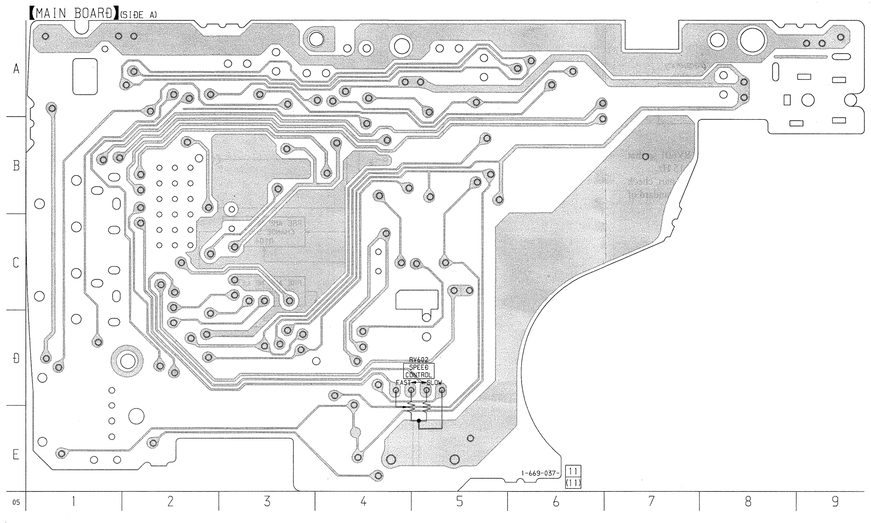
SECTION 5
DIAGRAMS

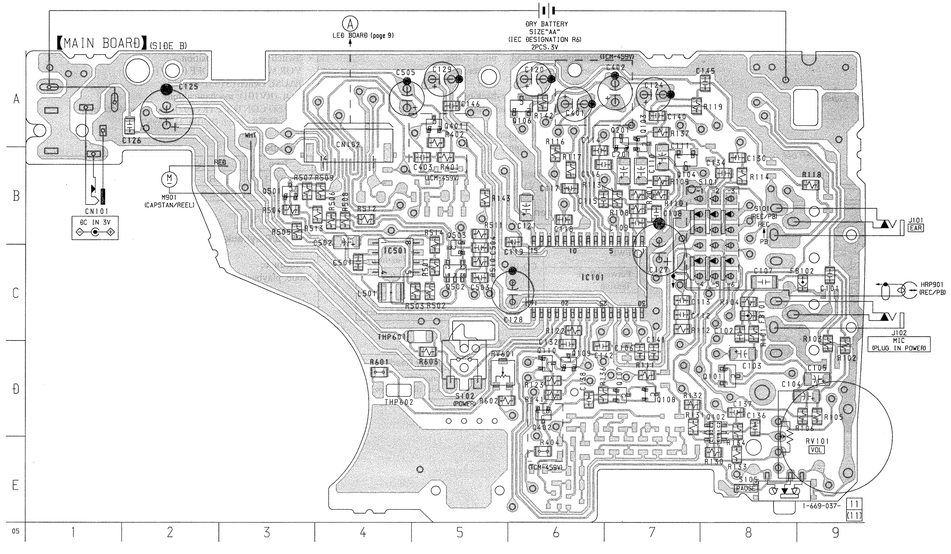
5-1. BLOCK DIAGRAM



5-2. PRINTED WIRING BOARDS







• Semiconductor Location (LED Board)

Ref. No.	Location
D501	D-1
D502	C-1
D503	B-1

Note on Printed Wiring Boards:
- ○——— : parts extracted from the component side.
- ——— : parts extracted from the conductor side.
- ▒▒▒ : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

Caution:	
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

• Semiconductor Location (MAIN Board Side B)

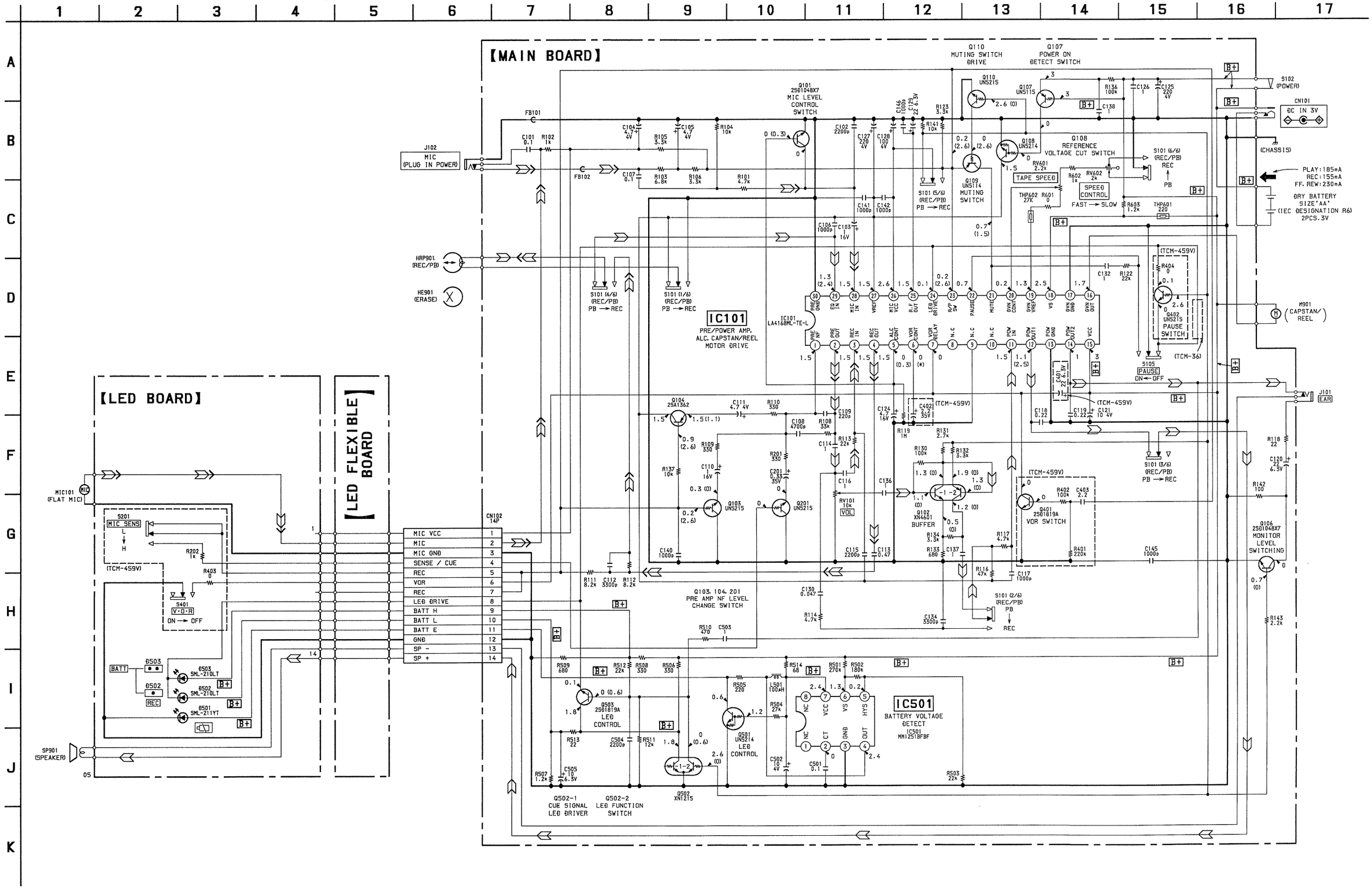
Ref. No.	Location
IC101	C-6
IC501	C-4
Q101	D-8
Q102	D-8
Q103	A-7
Q104	B-7
Q106	A-6
Q107	D-7
Q108	D-7
Q109	D-6
Q110	D-6
Q201	A-7
○Q0401	A-5
○Q0402	D-6
Q501	B-3
Q502	C-5
Q503	C-5

Note:
○: TCM-459V only

Note on Schematic Diagram:
- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼ W or less unless otherwise specified.
- ▭ : panel designation.
- B+ : B+ Line.
- ▭ : adjustment for repair.
- Total current is measured with no cassette installed.
- Power voltage is dc 3 V and fed with regulated dc power supply from external power voltage jack.
- Voltages are dc with respect to ground under no-signal conditions.
  no mark : PLAY
  ( ) : REC
  ✻ : Impossible to measure
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ▷ : PB
  ▷▷ : REC

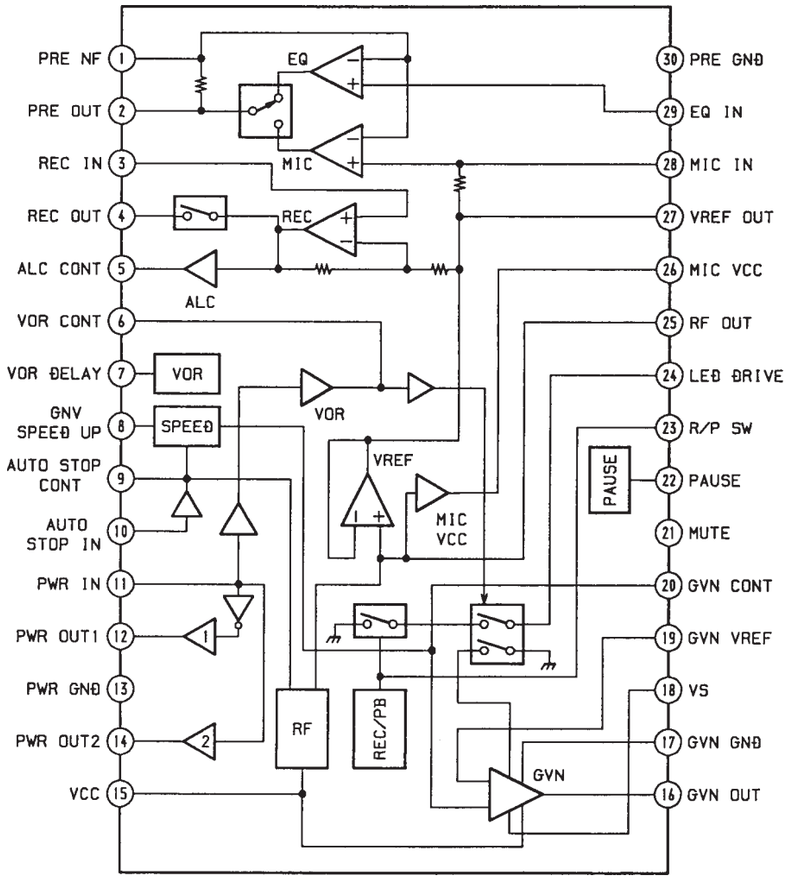
5-3. SCHEMATIC DIAGRAM

• See page 15 for IC Block Diagrams. • See page 12 for Note on Schematic Diagram.

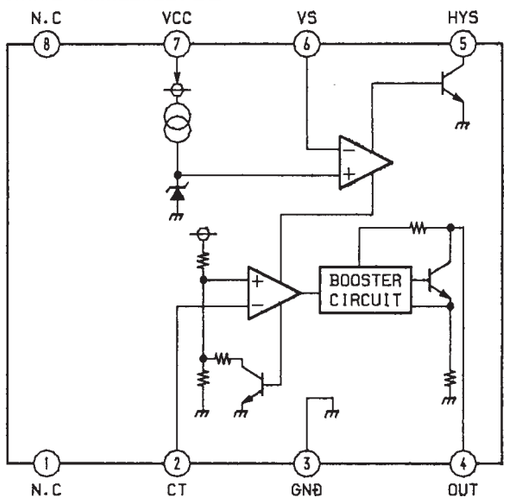


• IC Block Diagrams

IC101 LA4168ML-TE-L



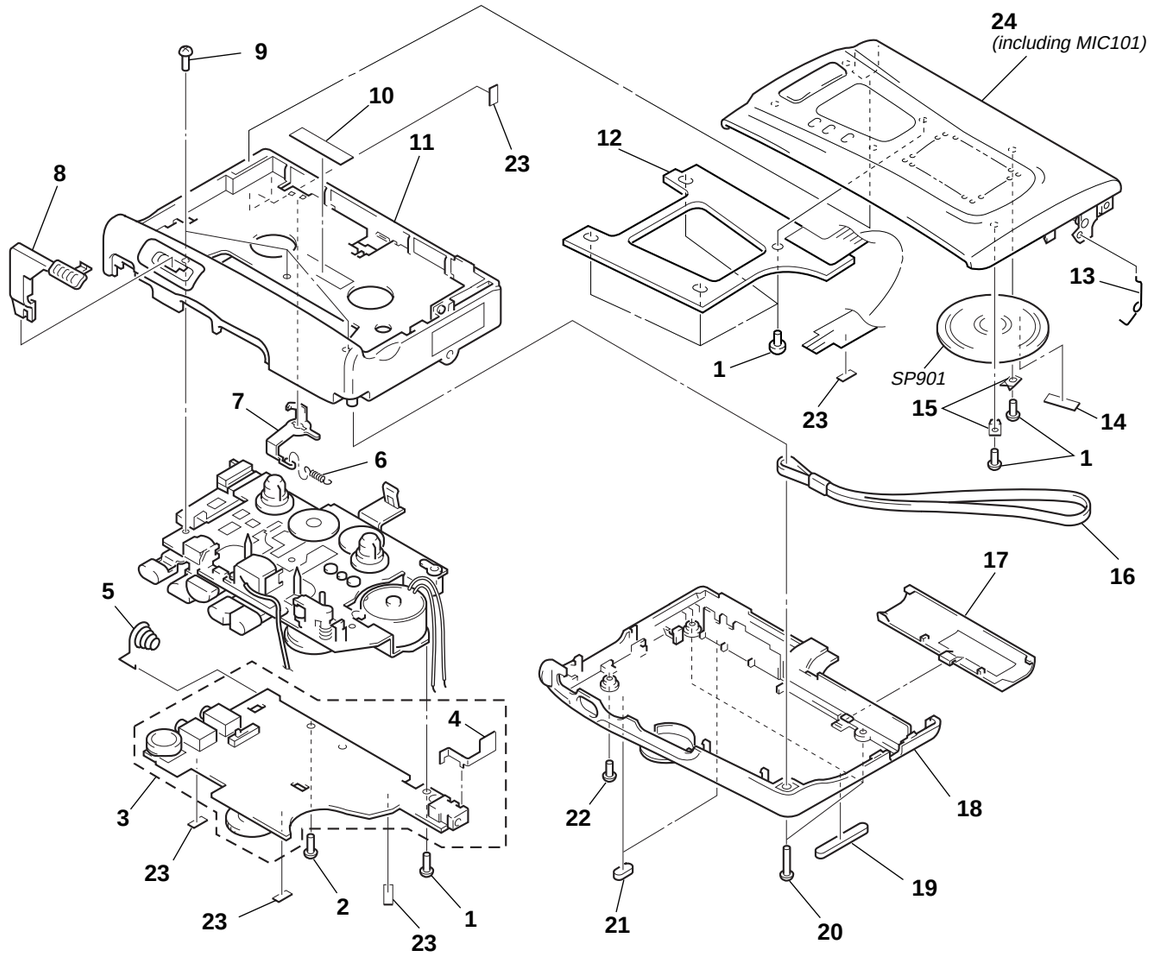
IC501 MM1251BFBE



SECTION 6
EXPLODED VIEWS

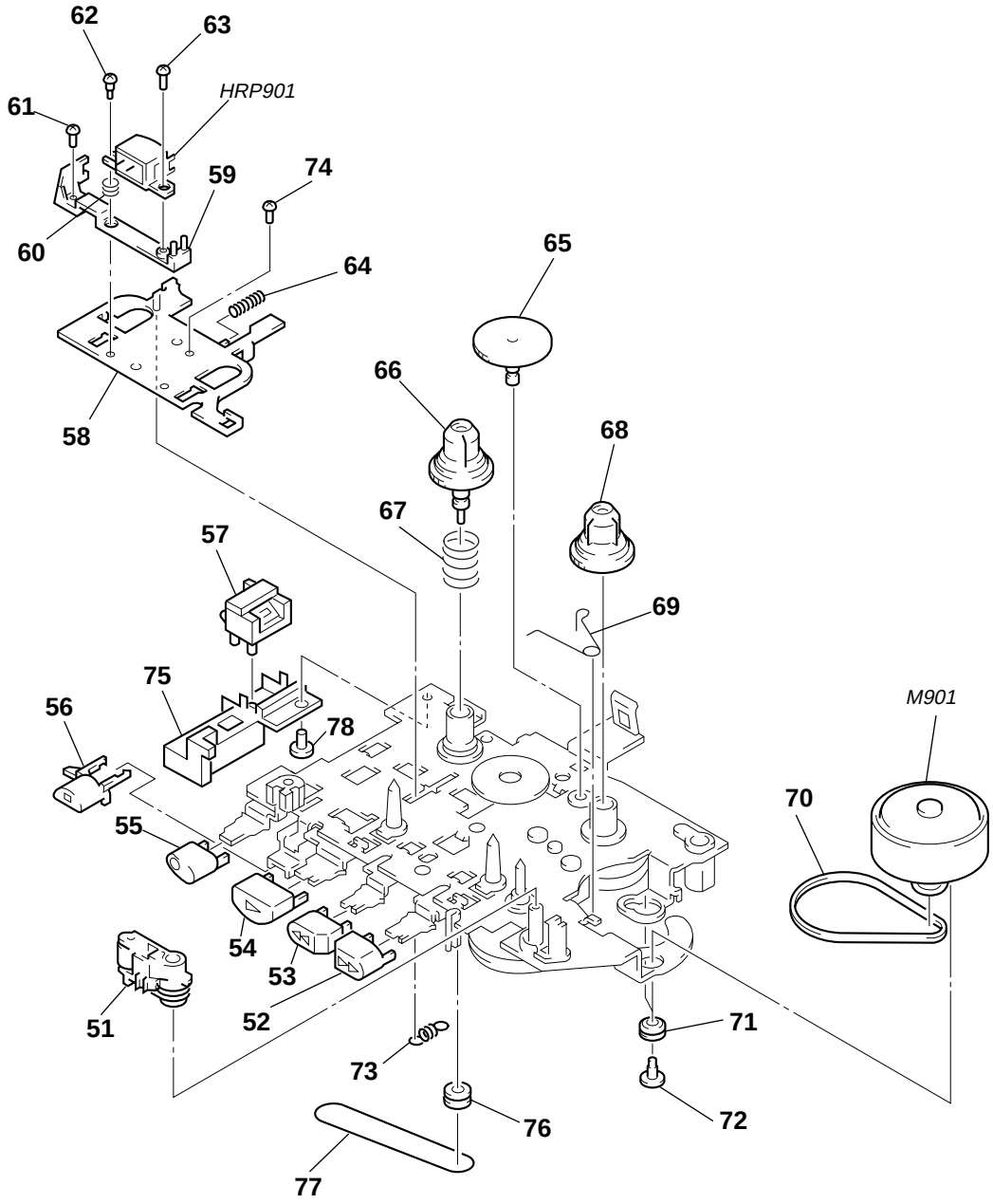
NOTE:
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts Color Cabinet's Color
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Accessories and packing materials are given in the last of the electrical parts list.

(1) CABINET SECTION



Ref. No.	Part No.	Description	Remark
1	3-318-382-31	SCREW (1.7), TAPPING	
2	3-345-648-51	SCREW (M1.4), TOOTHED LOCK	
* 3	A-3021-022-A	MAIN BOARD, COMPLETE (TCM-459V)	
* 3	A-3021-024-A	MAIN BOARD, COMPLETE (TCM-36)	
4	3-008-612-01	TERMINAL, PLUS	
5	3-924-750-01	TERMINAL, MINUS	
6	3-924-744-01	SPRING (CLAW DETECTION), TENSION	
7	3-018-311-01	CLAW, ERASING PREVENTION	
8	3-018-310-01	KNOB (PAUSE)	
9	4-969-980-21	SCREW (IB LOCK)	
10	3-578-101-41	PLATE, ORNAMENTAL	
11	3-018-307-01	CABINET (FRONT) (TCM-459V)	
11	3-018-307-31	CABINET (FRONT) (TCM-36)	
* 12	1-669-038-11	LED BOARD	
13	3-936-424-01	SPRING, CASSETTE	
14	4-017-441-01	CUSHION (B)	
* 15	3-924-757-01	BRACKET (SPEAKER)	
16	3-924-761-01	STRAP	
17	3-018-309-01	LID, BATTERY CASE	
18	3-018-308-11	CABINET (REAR) (TCM-459V)	
18	3-018-308-31	CABINET (REAR) (TCM-36)	
19	3-018-312-01	FOOT (A)	
20	3-334-565-11	SCREW (B1.7X10), TAPPING	
21	3-023-856-01	FOOT (B)	
22	3-907-531-01	SCREW	
23	3-831-441-XX	SPACER, KNOB	
24	X-3375-895-1	LID SUB ASSY, CASSETTE (TCM-459V) (including MIC101)	
24	X-3375-897-1	LID SUB ASSY, CASSETTE (TCM-36) (including MIC701)	
SP901	1-505-838-11	SPEAKER (3.6CM)	

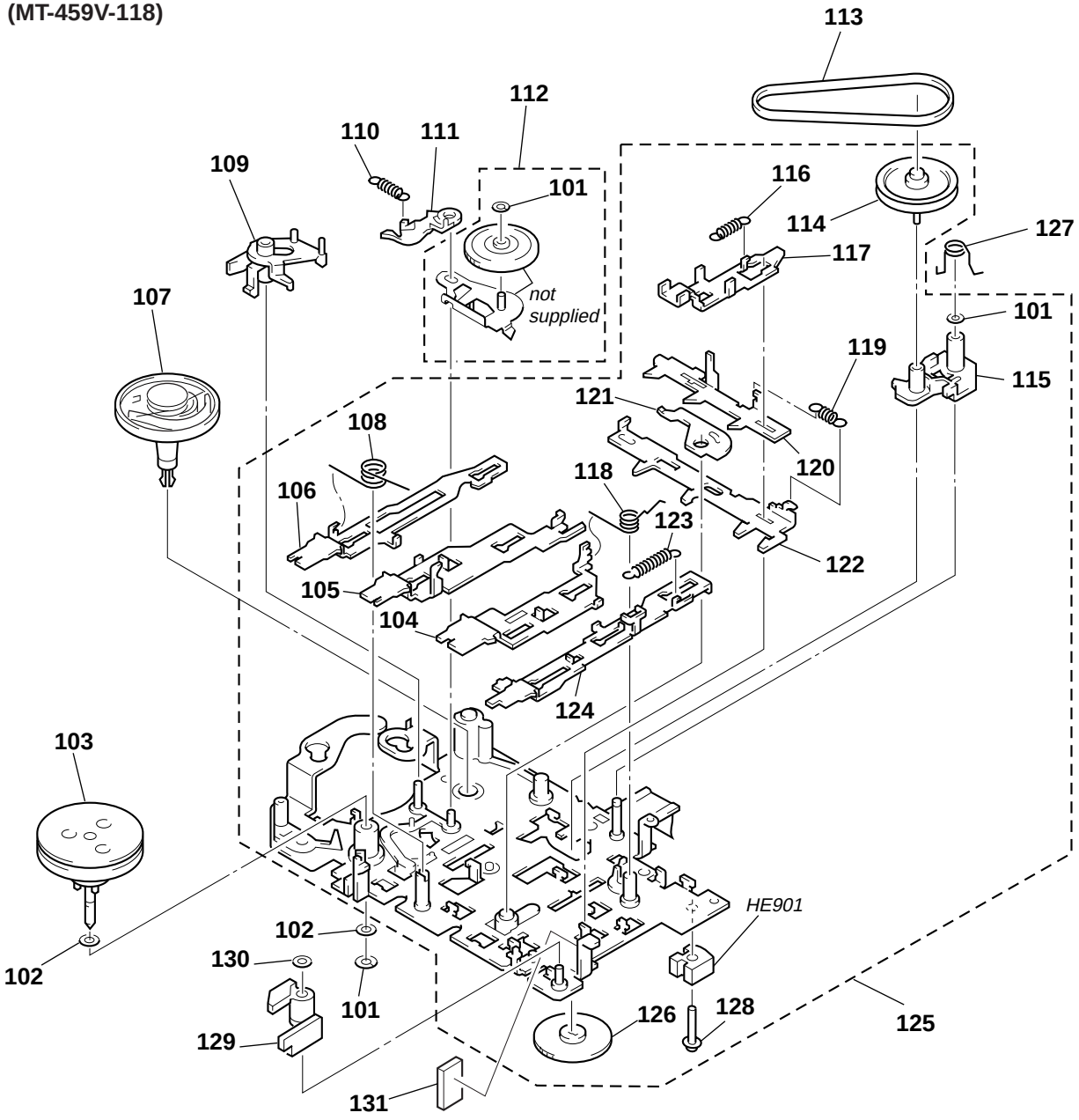
(2) MECHANISM DECK SECTION-1 (MT-459V-118)



Ref. No.	Part No.	Description	Remark
51	X-3370-386-1	PINCH ROLLER ASSY	
52	3-925-146-01	BUTTON (FF) (▶▶)	
53	3-925-147-01	BUTTON (REW) (◀◀)	
54	3-925-148-01	BUTTON (PLAY) (▶)	
55	3-925-145-11	BUTTON (REC) (●)	
56	3-936-409-01	BUTTON (STOP) (■)	
57	1-548-582-11	COUNTER, TAPE (SMALL TYPE)	
58	3-924-625-01	LEVER (HEAD)	
59	3-924-645-01	BRACKET (HEAD)	
60	3-924-685-01	SPRING (AZIMUTH), COMPRESSION	
61	3-704-197-91	SCREW (IB LOCK)	
62	3-375-135-01	SCREW (1.4), SPECIAL	
63	3-376-177-01	SCREW (M1.4X3.8)	
64	3-925-107-01	SPRING (IDLER), COMPRESSION	
65	3-924-637-01	GEAR (FF)	

Ref. No.	Part No.	Description	Remark
66	3-924-673-01	GEAR (S REEL)	
67	3-924-674-01	SPRING (B. T), COMPRESSION	
68	3-924-641-01	GEAR (T REEL)	
69	3-924-726-01	SPRING (M GROUND), TORSION	
70	3-924-681-01	BELT (CAPSTAN)	
71	3-925-109-01	CUSHION (MOTOR)	
72	3-925-108-01	SCREW (MOTOR)	
73	3-924-644-01	SPRING (POWER TENSION), TENSION	
74	3-348-160-11	SCREW (M1.4X1.6), PRECISION PAN	
75	3-018-522-01	COUNTER, BRACKET	
76	3-924-675-01	PULLEY (COUNTER)	
77	3-924-683-01	BELT (COUNTER)	
78	3-376-407-01	SCREW (M1.4)	
HRP901	1-500-073-11	HEAD, MAGNETIC (RECORD/PLAYBACK)	
M901	1-698-588-11	MOTOR, DC (CAPSTAN/REEL)	

(3) MECHANISM DECK SECTION-2 (MT-459V-118)



Ref. No.	Part No.	Description	Remark
101	3-321-483-11	RING, RETAINING (0.25)	
102	3-701-437-51	WASHER	
103	X-3370-384-1	FLYWHEEL ASSY	
104	3-924-623-01	LEVER (PLAY)	
105	3-924-621-01	LEVER (REW)	
106	3-924-620-01	LEVER (FF)	
107	X-3370-388-1	TABLE ASSY, FELT	
108	3-924-642-01	SPRING (FR), TORSION	
109	3-924-629-01	LEVER (DETECTION)	
110	3-925-207-01	SPRING (SHUT. OFF), TENSION	
111	3-924-630-01	LEVER (S. OFF)	
112	X-3370-387-1	LEVER ASSY, IDLER	
113	3-924-682-01	BELT (FR)	
114	X-3370-385-1	PULLEY (FR) ASSY	
115	3-924-628-01	LEVER (FR)	
116	3-924-633-01	SPRING (STOP), TENSION	
117	3-924-622-01	LEVER (STOP)	
118	3-924-643-01	SPRING (PR), TORSION	
119	3-924-684-01	SPRING (LOCK PLATE), TENSION	
120	3-924-619-01	LEVER (SW)	
121	3-924-639-01	LEVER (CR)	
122	3-924-618-01	LEVER (LOCK)	
123	3-925-208-01	SPRING (REC), TENSION	
124	3-924-624-01	LEVER (REC)	
125	X-3375-018-1	CHASSIS SUB ASSY	
126	3-924-613-01	GEAR (FR)	
127	3-024-378-01	SPRING (FR LEVER), TORSION	
128	3-703-925-21	SCREW (M1.4)	
129	3-936-405-01	LEVER (RELEASE)	
130	3-578-242-11	WASHER	
131	3-014-082-02	SPACER	
HE901	1-500-515-11	HEAD, MAGNETIC (ERASE)	

SECTION 7
ELECTRICAL PARTS LIST

LED **MAIN**

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F: nonflammable
- Abbreviation
  CH : Chinese
  CND : Canadian
  EE : East European
- Items marked "*" are not stocked since they are seldom required for routine service.
  Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA. . : µA. . uPA. . : µPA. .
  uPB. . : µPB. . uPC. . : µPC. .
  uPD. . : µPD. .
- CAPACITORS
  uF: µF
- COILS
  uH: µH

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark
*	1-669-038-11	LED BOARD			
		*********			
	1-669-039-11	LED FLEXIBLE BOARD			
		< LED >			
D501	8-719-057-99	LED SML-211YT-T86 (⇦)			
D502	8-719-059-96	LED SML-210LT-T86 (BATT • /REC)			
D503	8-719-059-96	LED SML-210LT-T86 (BATT ••)			
		< RESISTOR >			
R202	1-216-049-11	RES, CHIP	1K	5%	1/10W (TCM-459V)
R403	1-216-295-00	SHORT	0 (TCM-459V)		
		< SWITCH >			
S201	1-572-922-11	SWITCH, SLIDE (MIC SENS) (TCM-459V)			
S401	1-572-922-11	SWITCH, SLIDE (VOR) (TCM-459V)			
**********					
*	A-3021-022-A	MAIN BOARD, COMPLETE (TCM-459V)			
*	A-3021-024-A	MAIN BOARD, COMPLETE (TCM-36)			
		**********			
	3-008-612-01	TERMINAL, PLUS			
		< CAPACITOR >			
C101	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C102	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C103	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C104	1-135-151-21	TANTALUM CHIP	4.7uF	20%	4V
C105	1-135-151-21	TANTALUM CHIP	4.7uF	20%	4V
C106	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C107	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C108	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C109	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C110	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C111	1-135-151-21	TANTALUM CHIP	4.7uF	20%	4V
C112	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C113	1-164-005-11	CERAMIC CHIP	0.47uF		16V
C114	1-164-346-11	CERAMIC CHIP	1uF		16V
C115	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C116	1-164-346-11	CERAMIC CHIP	1uF		16V
C117	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C118	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C119	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C120	1-126-153-11	ELECT	22uF	20%	6.3V
C121	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C124	1-124-259-11	ELECT	4.7uF	20%	16V
C125	1-124-434-00	ELECT	220uF	20%	4V
C126	1-164-346-11	CERAMIC CHIP	1uF		16V
C127	1-124-434-00	ELECT	220uF	20%	4V
C128	1-124-433-00	ELECT	100uF	20%	4V
C129	1-126-153-11	ELECT	22uF	20%	6.3V
C130	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C132	1-164-346-11	CERAMIC CHIP	1uF		16V
C134	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C136	1-164-346-11	CERAMIC CHIP	1uF		16V
C137	1-164-346-11	CERAMIC CHIP	1uF		16V
C138	1-164-346-11	CERAMIC CHIP	1uF		16V
C140	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C141	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C142	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C145	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C146	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C201	1-135-073-00	TANTALUM CHIP	0.33uF	10%	35V
C401	1-126-153-11	ELECT	22uF	20%	6.3V (TCM-459V)
C402	1-124-257-00	ELECT	2.2uF	20%	35V (TCM-459V)
C403	1-164-505-11	CERAMIC CHIP	2.2uF		16V (TCM-459V)
C501	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C502	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C503	1-164-346-11	CERAMIC CHIP	1uF		16V
C504	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C505	1-126-157-11	ELECT	10uF	20%	6.3V
		< CONNECTOR/JACK >			
CN101	1-750-061-11	JACK, DC (POLARITY UNIFIED TYPE)			(DC IN 3V)
* CN102	1-691-378-21	CONNECTOR, FFC/FPC (ZIF) 14P			

MAIN

Ref. No.	Part No.	Description			Remark
		< FERRITE BEAD >			
FB101	1-414-235-21	INDUCTOR CHIP 0uH			
FB102	1-414-235-21	INDUCTOR CHIP 0uH			
		< IC >			
IC101	8-759-492-49	IC LA4168ML-TE-L			
IC501	8-759-399-49	IC MM1251BFBE			
		< JACK >			
J101	1-766-847-11	JACK (EAR)			
J102	1-766-847-11	JACK (MIC (PLUG IN POWER))			
		< COIL >			
L501	1-412-032-11	INDUCTOR CHIP 100uH			
		< TRANSISTOR >			
Q101	8-729-800-37	TRANSISTOR 2SD1048-X7			
Q102	8-729-402-84	TRANSISTOR XN4601			
Q103	8-729-420-50	TRANSISTOR UN5215			
Q104	8-729-230-72	TRANSISTOR 2SA1362YG			
Q106	8-729-800-37	TRANSISTOR 2SD1048-X7			
Q107	8-729-420-53	TRANSISTOR UN5115			
Q108	8-729-402-93	TRANSISTOR UN5214-TX			
Q109	8-729-402-96	TRANSISTOR UN5114			
Q110	8-729-420-50	TRANSISTOR UN5215			
Q201	8-729-420-50	TRANSISTOR UN5215			
Q401	8-729-420-24	TRANSISTOR 2SD1819A-QRS-TX			(TCM-459V)
Q402	8-729-420-50	TRANSISTOR UN5215 (TCM-459V)			
Q501	8-729-402-93	TRANSISTOR UN5214-TX			
Q502	8-729-403-17	TRANSISTOR XN1215			
Q503	8-729-420-24	TRANSISTOR 2SD1819A-QRS-TX			
		< RESISTOR >			
R101	1-216-065-00	RES, CHIP	4.7K	5%	1/10W
R102	1-216-049-11	RES, CHIP	1K	5%	1/10W
R103	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R104	1-216-073-00	METAL CHIP	10K	5%	1/10W
R105	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R106	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R108	1-216-085-00	METAL CHIP	33K	5%	1/10W
R109	1-216-037-00	METAL CHIP	330	5%	1/10W
R110	1-216-037-00	METAL CHIP	330	5%	1/10W
R111	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R112	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R113	1-216-081-00	METAL CHIP	22K	5%	1/10W
R114	1-216-065-00	RES, CHIP	4.7K	5%	1/10W
R116	1-216-089-00	RES, CHIP	47K	5%	1/10W
R117	1-216-065-00	RES, CHIP	4.7K	5%	1/10W
R118	1-216-009-00	METAL CHIP	22	5%	1/10W
R119	1-216-121-00	RES, CHIP	1M	5%	1/10W
R122	1-216-081-00	METAL CHIP	22K	5%	1/10W
R123	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R130	1-216-097-00	RES, CHIP	100K	5%	1/10W
R131	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R132	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R133	1-216-045-11	METAL CHIP	680	5%	1/10W
R134	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R136	1-216-097-00	RES, CHIP	100K	5%	1/10W
R137	1-216-073-00	METAL CHIP	10K	5%	1/10W
R141	1-216-073-00	METAL CHIP	10K	5%	1/10W
R142	1-216-025-00	RES, CHIP	100	5%	1/10W
R143	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R201	1-216-037-00	METAL CHIP	330	5%	1/10W
R401	1-216-105-00	RES, CHIP	220K	5%	1/10W (TCM-459V)
R402	1-216-097-00	RES, CHIP	100K	5%	1/10W (TCM-459V)
R404	1-216-295-00	SHORT	0 (TCM-459V)		
R501	1-216-107-00	METAL CHIP	270K	5%	1/10W
R502	1-216-103-00	METAL CHIP	180K	5%	1/10W
R503	1-216-081-00	METAL CHIP	22K	5%	1/10W
R504	1-216-083-00	METAL CHIP	27K	5%	1/10W
R505	1-216-033-00	METAL CHIP	220	5%	1/10W
R506	1-216-037-00	METAL CHIP	330	5%	1/10W
R507	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R508	1-216-037-00	METAL CHIP	330	5%	1/10W
R509	1-216-045-00	RES, CHIP	680	5%	1/10W
R510	1-216-041-00	METAL CHIP	470	5%	1/10W
R511	1-216-075-00	METAL CHIP	12K	5%	1/10W
R512	1-216-081-00	METAL CHIP	22K	5%	1/10W
R513	1-216-009-00	METAL CHIP	22	5%	1/10W
R514	1-216-021-00	METAL CHIP	68	5%	1/10W
R601	1-216-295-00	SHORT	0		
R602	1-216-049-11	RES, CHIP	1K	5%	1/10W
R603	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
		< VARIABLE RESISTOR >			
RV101	1-225-597-11	RES, VAR, CARBON 10K (VOL)			
RV601	1-223-584-11	RES, ADJ, CARBON 2.2K			
RV602	1-225-598-11	RES, VAR, CARBON 2K (SPEED CONTROL)			
		< SWITCH >			
S101	1-771-321-11	SWITCH, SLIDE (REC/PB)			
S102	1-771-092-21	SWITCH, PUSH (1 KEY) (POWER)			
S105	1-572-922-11	SWITCH, SLIDE (PAUSE)			
		< THERMISTOR (POSITIVE) >			
THP601	1-810-007-11	THERMISTOR, POSITIVE			
THP602	1-803-117-11	THERMISTOR, POSITIVE			

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MISCELLANEOUS

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HE901	1-500-515-11	HEAD, MAGNETIC (ERASE)
HRP901	1-500-073-11	HEAD, MAGNETIC (RECORD/PLAYBACK)
M901	1-698-588-11	MOTOR, DC (CAPSTAN/REEL)
SP901	1-505-838-11	SPEAKER (3.6cm)

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Ref. No.	Part No.	Description	Remark
		ACCESSORIES & PACKING MATERIALS	
		**********	
	3-862-203-02	MANUAL, INSTRUCTION (JAPANESE, ENGLISH) (TCM-36: Tourist)	
	3-862-203-11	MANUAL, INSTRUCTION (ENGLISH) (TCM-459V: US, AEP, EE, CH)	
	3-862-203-21	MANUAL, INSTRUCTION (ENGLISH, FRENCH) (TCM-36/459V: CND, E)	
	3-862-203-31	MANUAL, INSTRUCTION (FRENCH, SPANISH, PORTUGUESE, ITALIAN) (TCM-459V: AEP)	
	3-862-203-41	MANUAL, INSTRUCTION (GERMAN, DUTCH, SWEDISH, DANISH) (TCM-459V: AEP, EE)	
	3-862-203-51	MANUAL, INSTRUCTION (SPANISH, PORTUGUESE, CHINESE, KOREAN) (TCM-36/459V: E)	
	3-862-203-61	MANUAL, INSTRUCTION (CHINESE) (TCM-459V: CH)	
	3-862-203-71	MANUAL, INSTRUCTION (POLISH, RUSSIAN, HUNGARIAN, CZECH) (TCM-459V: EE)	

MEMO

Printing Method for Large Sized Documents Such As Circuit Diagrams

Printing the page that exceeds A4-size two pages (or letter size) is possible by specifying the print range. (Acrobat Reader Version 4.0 or later)

1. The enlarged print is made, if a smaller range than A4 size is specified and the A4 size is selected as a print paper.
2. Almost real sized print is made, if the range is specified, meeting the print paper size.
3. The reduced print is made, if a larger range than the print paper size is specified.

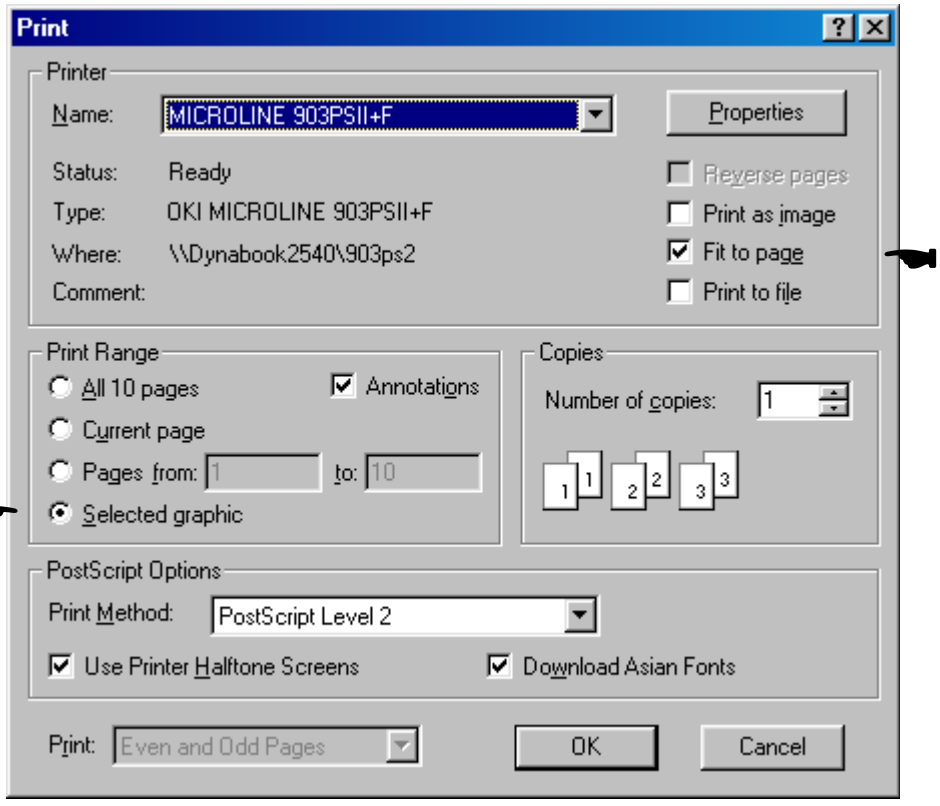
Printing by Specifying a Range

In printing out the drawings such as a schematic diagram and a printed wiring board larger than the printed paper size, they can be printed by specifying the range. (Acrobat Reader Version 4.0 or later)

1. Display the page to be printed.
2. From the File menu, select [Page Setup] and set the paper size.
3. From the Command bar, select [Graphic Select Tool].

   (Keep pressing , select)

4. Dragging the cursor, enclose the range on the page to be printed.
5. From the File menu, select [Print] and make sure that the [Selected Graphic] is already checked. Also, if [Fit to page] is checked, the selected range is enlarged or reduced (and rotated as necessary) meeting the paper size.



6. To cancel the printed range, click an arbitrary position on the screen.

REVISION HISTORY

Clicking the version allows you to jump to the revised page.
Also, clicking the version at the upper right on the revised page allows you to jump to the next revised page.

Ver.	Date	Description of Revision
1.0	1998.02	New
1.1	1998.10	Change of Part No. for INSTRUCTION MANUAL (TCM-36: Tourist)
1.2	2004.03	Addition of DIAGRAMS